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R. Biggs, Esq. 'Lettere sulla Tunisia, sulle Province di Susa, e Montasir.' R. A. Wilson's 'History of the Conquest of Mexico.' 1859. Purchased. Faidherbe's 'Recherches anthropologiques sur les Tombeaux Megalithiques de Koknia.' 1868. Donor, the author. G. Marsh's 'Physical Geography.' 1864. Purchased. F. Millingen's 'La Turquie sous la Règne d'Abdul Aziz, 1862-1867.' Donor, the author. Street's 'Indian and Colonial Directory, 1867-8.' Donor, the author. J. Chapman's 'Travels in South Africa.' 1868. Purchased. A. Forster's 'South Australia, 1866.' Presented. L. Agassiz's 'Journey in Brazil.' 1868. Purchased.

ACCESSIONS TO THE MAP-ROOM SINCE THE LAST MEETING OF MAY 11TH, 1868.—A Map of the Arctic and Antarctic Regions, showing the Discoveries up to the present date, and the proposed German exploration from Bergen, in Norway, to Sabine Island, in North-eastern Greenland. Presented by Dr. A. Petermann. Diagram showing the change of temperature and atmospheric pressure in various parts of Switzerland during the years 1863-5 and 1867. Presented by Professor J. M. Zeigler. Four sheets of the Geological Map of Sweden, viz., Eriksberg, Nyköping, Tärna, Sämsholm, with four books of letter-press. A small Map of India in 1868. Presented by E. Weller, Esq. Map showing the Route of the Pundit in Tibet under the direction of Capt. T. G. Montgomerie. Presented by Dr. A. Petermann. A view of Magdala, from a sketch by Th. von Heuglin. Presented by the War-Office, Pall Mall, through Sir E. Lugard. A Map to accompany Gerhard Rohlfs' 'Narrative of his Last Journey.' Presented by Dr. A. Petermann. A bark canoe from Tierra del Fuego, with paddles, fishing-gear, and baling-buckets. Presented by William Robinson, Esq., Governor of the Falkland Islands.

The following Papers were read :—

1. *On a Project for the Scientific Exploration of Central Australia.*

By DR. G. NEUMAYER.

AFTER an historical introduction, giving an account of the progress of discovery and exploration in Australia, and showing what great influence the difference in the physical character of the north-west and south-east coasts exerted on the occupation of the continent by Europeans, the author proceeded to say that :—

Soon after the discovery of gold in the east and south-east, our knowledge of the interior of Australia became very much enlarged, it having become imperative to look for fresh pasture-ground. The farther inquiry was pushed towards the north and towards

the interior, the farther receded the once so much dreaded desert. Scientific inquiry had already anticipated the result of actual exploration; inasmuch as meteorological and geological facts, derived from observations in the colonies surrounding the interior, spoke very strongly against the desert doctrine, which at last, through the glorious achievements of Burke and Wills in the east, and of Stuart in the centre of the continent, was proved to be fallacious. What was once regarded to be the main character of the whole country was now demonstrated to belong only to belts and strips of land lying amidst tracts of fine country, with thousands of square miles well adapted for pastoral purposes.

Although since 1862 the eastern portion of the continent, near M'Kinlay's and Landsborough's tracks, has several times been crossed and recrossed, nothing has been added to our scientific knowledge of the country thus opened out; the question as to its capabilities having been but very slightly examined, and even of the fate of Dr. Leichhardt we remained as ignorant as ever. To the unprejudiced mind it was apparent that these shortcomings were mainly attributable to a want of system in the exploration of the interior, and of conjoint action on the part of the Colonies which at various times have entered on explorations of this nature. Had the same amount of money, daring, and energy been expended on an uniform system of exploration, there could be little doubt that our knowledge would have been considerably more accurate than it is at present.

A glance at the map shows us that an immense tract of land is entirely unknown. Indeed, we might describe a circle in the portion lying to the west of Stuart's track, enclosing an area of half a million of square miles, of which our knowledge is absolutely *nil*. We should form a more adequate estimate of this fact, if we considered that this is at the same time the greatest absolute blank on the face of the globe,—the polar regions excepted; as we know more even of that great tract of country on the African continent which lies south of the equator and near the western coast. This "*Terra Australiensis incognita*" is somewhat less than one-fifth of the entire continent, and forms the western slope of what we are justified—according to all appearances—in terming the Great Interior Basin.

The northern limit of this basin has been approximately determined by the observations of Stuart, Gregory, Landsborough, M'Intyre, and Walker; and may be roughly indicated by a line running from 18° s. in the north-west to 22° s. in the north-east. In 25° s. and 147° E., we meet the watershed of the rivers flowing

to the interior and those flowing to the Indian Ocean,—Warrego, Darling, Murray. From Mr. F. Gregory's explorations in the west and north-west, it seems probable that the dividing range, which has never been crossed in that quarter, runs at a distance from the coast of from 200 to 300 miles and upwards. Now, if we determine the centre of the continent exactly (the point in which the whole mass of land, irrespective of elevation, may be regarded as concentrated), we find its position to be in 26° s. latitude, and 134° E. longitude; and if we farther describe round this point an ellipse, of which half the minor axis is equal to the approximate distance of the centre from the watershed on Stuart's track (510 miles) on the meridian, and half the major axis equal to the distance from the centre to the dividing range between the Barcoo and Warrego rivers (900 miles) on the parallel of latitude, we shall mark off approximately the limits of the interior basin. It is of considerable interest to note, as far as known, the elevations along this elliptical line. In the far west, at the extreme end of the longer axis, the sandstone table-land appears to attain an average elevation of from 2000 to 3000 feet, with peaks of trap-rock and granite rising to 4000 feet and more. Near the head of the Victoria of Gregory the dividing ranges appear to be 1300 feet high, and on M'Intyre's route 1500 feet, with occasional elevations of 1800 feet; their height above the surrounding country being not more than 200 or 300 feet. On Walker's track the watershed sinks to 1000 feet; whilst near the head of the Barcoo (Happy Valley) we know it to be 1658 feet. In the south-east, near Mount Murchison, it passes across ranges of 2000 feet elevation; whilst in the south-west, in latitude 30° s., it is from 1000 to 1400 feet; but then rapidly descends to the ocean, and, after disappearing in the great Australian bight, emerges again, and crosses the Eyria Peninsula, in parts 2000 feet high. In the latter instance our elliptical arc divides the waters draining to the ocean and those to Lake Gairdner; thus, even in this case, limiting the interior basin. The area of the country encircled by the above elevations amounts approximately to one million and a half square miles, and is, therefore, nearly the same as that of the coast river-drainage; the total area of the whole continent being something like three millions of square miles.

Through this immense expense of land M'Dougal Stuart forced his way from Adelaide to the shores of the Van Diemen's Gulf, nearly dividing it into two equal parts. Of the country to the west of his tract, containing our "*Terra Australiensis incognita*," nothing is known; although since 1860 great efforts have been made to increase our geographical knowledge of the eastern half. Notwith-

standing these efforts, even in this portion great areas are entirely unexplored—that between Stuart's and Burke's track to wit.

From the various expeditions made since Burke first crossed the continent, we gather that the watercourses in the interior flow partly towards the south, spreading over immense plains and causing during the rainy season great inundations in the country in 26° s., and between 138° and 141° E. To this fact we must to some extent look for an explanation of the origin of the so-called "Stony Desert" and the barren plains immediately to the north of it, which are shown on our map and formed at one time such a great impediment to the progress of explorers. Whatever of the drainage to the east of Burke's track is not of this character flows into the one great river-system of the eastern interior, the Barcoo (Victoria, Cooper's Creek), which, after a course of 1000 miles, empties itself into Lakes Eyre and Gregory, forming after its bifurcation a large river delta. It is not unreasonable to suppose that in the case of the watercourses in the unknown western parts of the continent a similar state of things must prevail. Probably some extensive drainage finds its outlet into lakes to the north of the Australian Bight, some 200 or 300 miles inland; for the author could not concur in the opinion—though expressed by so high an authority on Australian geography as the Rev. J. E. T. Woods—that Lake Gairdner would ultimately prove to be the main receptacle for the western interior drainage, inasmuch as this lake, if the observations be correct, is close upon 300 feet above the sea, whilst the elevation of Lake Eyre is only 70 feet. Indeed, it is difficult to conceive how, with such an elevation, any extensive reservoir could exist in that locality; and he felt inclined to believe that this large sheet of water, as it appears at present on our maps, would be greatly reduced in size, after a careful survey. It forms, in all probability, only the reservoir for the waters draining from the Gawler Ranges and others in the vicinity.

If the supposition respecting the situation of the main lake in the West should prove to be correct—and there are strong reasons in support of it—then it is equally certain that some long-extended system of watercourses stretches its branches as far towards the interior as longitude 124°, and near the tropic of Capricorn, of which we could not have obtained any knowledge by explorations along the coast. A shorter distance from the receptacle would involve an average fall of drainage far too large to be compatible with the nature of an interior system of drainage; and those explorations leave no doubt that "an intermediate river-system," like that of the Murray in the east, does not exist in the west; on the contrary,

from the explorations of Lefroy and others, it is made highly probable that numerous salt lakes of minor extent will be discovered in the whole of the country north of the Bight, which receive the drainage of the south-western portion of the interior basin.

Meteorological phenomena, in so far as they exert any influence with respect to the appearance of a country, such as that with which we have to deal, would, in the opinion of the author, act rather in favour of the country to the west of the continent. The principal feature in the difference of appearance between the sea-boards in the north-west and in the south-east, was the great distance to which the high mountain ranges in the north-west recede from the coast when compared with those in the south-east; but though it is obvious that such a difference would have operated, in the first instance, on the discoverer's mind, it is difficult to conceive how it could possibly create such a prejudice against the north-western coast as could not be dispelled by a closer examination. Explorations have to a great extent, indeed, dispelled the preconceived opinions respecting the coast between 20° and 26° s. latitude; and the fine rivers and harbours with which it is now known to abound place it beyond the reach of doubt that these parts also of Australia will participate in the great future which that fine continent is destined to enjoy. Now that it is known that an enterprising squatter succeeded in taking 2200 sheep from the Geraldine Mine on the Murchison, to Nickol Bay, by way of the Upper Gascoyne and the Alma, and that, too, without losing more than eight; and further, that the settlement at Nickol Bay (21° s. and 116° e.) is progressing favourably; any doubts as to the practicability of the north-west coast can no longer be entertained: the less so as, in all probability, mineral resources known to exist near the mouths of the fine streams flowing from the high ranges, described by various explorers, will likewise be found higher up the valleys, and will add materially to the future wealth of the region. Colonisation efforts, however, have of late been mainly directed towards the country round the Gulfs of Carpentaria and Van Diemen, and it has been left to the colony of Western Australia to do the best it could in that quarter. It is not difficult to see that these colonies, separated as they are from their eastern sisters by a vast unknown territory, will have to struggle hard to make any progress: indeed, such progress is scarcely possible unless they extend their territory towards and across the watershed of the interior basin, and unless overland communication be established between them and the other colonies. The author had no doubt whatever that an exploration of that great blank on our map would materially assist, nay establish, such a communication, prac-

licable at all seasons, for the mutual benefit of the colonies, and give thereby a fresh impetus to the spirit of enterprise in the country.

Such an extension of the field of colonisation must have great importance for the interests of the mother country and the British possessions in India. It would tend to secure for the superfluous wealth of the Eastern colonies a new field whereon to expend itself, and from which India could be supplied with Australian products of every description, and that, too, in half the time in which this can now be effected, and across an ocean almost entirely devoid of danger or risk. It is moreover evident that, under certain emergencies with respect to the British dominions in India, emergencies which might arise at any moment, rapid communication and easy access to the dependencies in Australia would prove of the utmost importance, and cannot be estimated too highly. But the north-western coast cannot be successfully colonised without previously exploring that great western territory between Cambridge Gulf and the Australian Bight; and that this might be effected on the base of Stuart's track through the interior, the author hoped to be able to prove hereafter. If, on the one hand, the exploration of the interior be all-important for the complete success of colonisation in Australia, on the other hand it is also eminently calculated to promote the interests of science.

There was now offered an opportunity, such as is rarely to be met with, of furthering in the highest degree the interests of science, in comparison with which the sacrifices necessary on our part sank into utter insignificance. Surely the time had now arrived for us to emulate the bright example set us by that great explorer Flinders by exploring and opening up the interior in a scientific manner, as he explored and opened up the coast-line surrounding it. Scientific skill and research once brought to bear upon our knowledge of this vast interior, and in its very heart, would be sure to reverberate towards the exterior, in producing wealth and prosperity, and in giving a fresh impulse to the efforts of colonisation.

Twenty years ago, on the 3rd of April, 1848, the last news was received in Sydney of Dr. Leichhardt, when on the eve of his departure for the interior on that great expedition from which he was never to return. The professed object of this undertaking was the examination of the interior along the route from Moreton Bay to Swan River, with the special *object of observing the gradual change in vegetable and animal life from one side of the continent to the other*. A glance at the map will show that such a route would pass through the centre of the elliptical-shaped interior basin, and would for this

reason, if properly carried out, prove of the highest importance in forming correct ideas respecting its physical geography. We all know, however, that Leichhardt did not make his appearance in the west, that he has never been heard of since the above date, and that all the expeditions in search of him have, up to the present time, failed signally in ascertaining his probable fate. Notwithstanding all the efforts that have been made, we have no further intelligence of him except that he had been at the Alice River, in 24° s. and 145° E.; but of his course from that point, at which he had but just entered the field of exploration, we are in total ignorance.

For reasons contained in part in the explanations just alluded to, and in part detailed at some length in the paper read before the Royal Society, and printed in their 'Proceedings,' the author proposed that such an expedition should proceed from Port Denison, near the Burdekin or the Bowen (20° s. and 148° E.) to a point in $24\frac{1}{2}^{\circ}$ s., on Stuart's track. Along that route it is proposed to establish six dépôts in succession, each to be retained only for so long as may be requisite for the examination of the neighbouring country, and for the formation and transport to the following. The distance to be travelled between these two points is 1080 miles, to which fifteen months will be devoted, allowing, even with a very moderate rate of travelling, a stay in each of the dépôts of nearly two months. At point B (on the author's map) the dépôt is to be fixed somewhere between the Hugh and Fincke rivers; and it is intended to send from this place a party to the nearest settlements in South Australia, partly for the purpose of securing all collections, observations, &c., made up to that time, and partly for the purpose of receiving a fresh supply of stores, and, if necessary, fresh horses and men for the expedition. By the time it will have arrived at that part of the interior, stations will have been pushed forward to the north of Mr. Jarvis's station at Mt. Margaret; but, in any case, such an arrangement will not meet with any great difficulties, so that the expedition will be enabled to make a fresh start from that point through the interior on the basis of Stuart's track. This is of the more importance, as an opportunity will be thereby afforded of receiving any information respecting discoveries which may have been made in the west during the absence of the expedition from the settled districts, and which may materially assist its further movements. In penetrating the entirely unknown country, it is proposed to keep upon the same latitude as far as point C in $125\frac{2}{3}^{\circ}$ E., thence to proceed on this meridian to 27° s., and from there to strike out for point D on the banks of the Swan River in $31\frac{1}{2}^{\circ}$ s. and $116\frac{1}{4}^{\circ}$ E. The total distance on this line is 1569 miles, for which twenty-seven

months will be required; and eight depôts will have to be formed approximately in the positions indicated on the map.

So far as known, there is on this route the greatest likelihood of meeting with practicable country,—that is to say, of meeting with no very great difficulties in the progress arising from the character or configuration of the soil and the vegetation with which it may be covered, and that there is every probability of being able to obtain ample supplies of water, grass, game, &c. It is upon these points, indeed, that the author in great measure grounded his hopes of ultimate success, as it was intended, on the present expedition, to avail ourselves, to the greatest possible extent, of the natural resources of the country. These, by the proposed method of procedure, and particularly by the formation of temporary depôts, it was hoped to turn fully to account in a way which would be utterly impossible in passing hurriedly through such a vast extent of unknown country.

The principle of partial self-support once adopted must necessarily influence to a great extent the equipment of an expedition, especially with reference to its stock of provisions. These will mainly have to be selected with a view to supplement, in their nourishing effects, the natural products of the country. This is not the place to enter upon a discussion of the physiological side of this question; suffice it to say that sufficient experience was now collected to enable us to form an accurate estimate of what will be placed at our command in passing through the interior, and to make it most productive of benefit to the explorers.

The object of primary importance is certainly to preserve the party in health and strength, and protect it against the ravages of scurvy and similar diseases. But all the precaution of medical skill would prove ineffectual if measures be not adopted against depression of spirits and the want of mental elasticity. The monotonous character of Australian scenery and the absence of adventurous excitement in Australian travel are both eminently calculated to predispose mind and body to disease. Care should, therefore, be taken to anticipate these deleterious influences by some energetic agency keeping mind and body in continual exercise. As such an agency none was more beneficial, and at the same time more useful, than the employment and participation of every member of the expedition—according to individual capacity—in the execution of the scientific surveys and labours.

Such were the principles on which the expedition was to be organised; some of the leading points in its organisation were as follows:—

(1.) Geographical discovery and scientific survey are the main objects of the proposed expedition.

(2.) All branches of natural science are to be included in the general plan of organisation, so far as this is compatible with the main objects in view.

(3.) The party to consist of twenty-five men, inclusive of seven professional men: leader; assistant-leader; geologist, botanist, and medical officer; zoologist and medical assistant; artist and photographer, and assistant observer.

(4.) For means of transport it is proposed to take fifty horses and ten camels, which latter animals have been acclimatised in the colonies, and show a special fitness and adaptation for Australian exploring work.

(5.) The probable expense of the expedition, extending over a period of three years and a half, is calculated to amount to 21,535*l*.

(6.) All money transactions are to be committed to the hands of a committee of administration, consisting of five members, and residing in the colonies. The members of the expedition are to be considered as salaried officers.

(7.) The results of the expedition,—collections, diaries, maps, &c.,—are, on the completion of the expedition, to be placed in the hands of the committee, to be turned to account in the interests of science and of the various countries which have participated in the undertaking.

Although lines of demarcation had been drawn across the continent from shore to shore, defining the boundaries of the several colonies, it is manifest that such a division, if strictly adhered to in respect to schemes of exploration and scientific research—each of the colonies confining its efforts to its own vast territory, without regard to the remainder of the continent—would so impede the progress of geographical knowledge, that there would be but slender prospect of the speedy attainment of the much-desired information respecting the interior. Moreover, the greater part of the unknown western interior, as well as the northern seaboard, cannot be regarded as included in the boundaries of either of the colonies, so that the mother-country might not unreasonably be expected to take an active part in the exploration. And while, under the circumstances, the proposed method of providing the necessary funds appears to be the fairest possible, the share of the burden falling on each of the several communities is thus reduced to an amount insignificant when compared with the probable results of the undertaking.

The author therefore believed this to be a case in which this Society

might very properly exert its powerful influence to aid in bringing about that co-operation which alone can lead to great results, both with regard to the interests of science and to colonisation. The importance of the enterprise, from a purely scientific point of view, was beyond dispute; and he should deem it presumption on his part were he to attempt to bring this part of the subject more prominently before this Society. It was rather on the ground of the extension of our geographical knowledge, with the view of opening up new fields for the spread of civilisation, and successfully completing the colonisation of one of the finest countries on the face of the globe, that he solicited the support of the Royal Geographical Society on the present occasion.

The PRESIDENT explained to the Meeting that Dr. Neumayer was a gentleman distinguished as a physicist and magnetician, who, having been for some time in Australia, was well acquainted with the difficulties that he would have to encounter in such an expedition as he proposed. He (the President) need not remind the older members of the Society how ignorant we were, comparatively few years ago, of the geography of Australia, and what an epoch of discovery was commenced when Sturt and that very remarkable man, General Eyre, late Governor of Jamaica, made their explorations. No man in Australia had passed through greater difficulties, or had endured personal hardships with more hardihood and perseverance than his friend Ex-Governor Eyre. He traversed 1800 miles of country along the southern part of the continent; but, unfortunately, without discovering any of those fertile tracts which have since been met with in the interior of Australia. The region travelled over by him consisted of great arid districts, where he suffered fearfully for want of food and water; but he would remind the meeting that he had still the welfare of the inhabitants at heart, for Ex-Governor Eyre was known as the protector of the aborigines of Australia. To these early expeditions succeeded the explorations of Stuart, Burke, Wills, Landsborough, M'Kinlay, and others; and from what had been done by them and by Leichhardt and others, we had been led to believe that fertile country existed across the continent in the part intersected by the parallel of 23° of south latitude. It was upon this knowledge that Dr. Neumayer had founded his rational project of an expedition, by which he hoped to succeed in traversing for the first time that great continent from east to west. The results of such an exploration to naturalists and physicists, indeed, to all men of science, would be of the highest importance. As one of the most eminent naturalists in the world (Professor Owen) was present, he hoped that gentleman would inform them what he thought might probably be discovered in his department of science along this great line of march, and by such an expedition. He saw also Professor Tyndall in the room, who, he hoped, would also tell them what was to be expected in the domain of physical science from this exploration.

Prof. OWEN said he quite coincided with the author of the paper, in his observation as to the limited amount of our knowledge respecting the natural history and capabilities of Australia. There was no part of the earth of which we Englishmen, who had derived so much from that fifth continent, knew so little as to its organic productions. The little that we do know related to a comparatively small part of the southern and eastern coasts. Beyond that limited region the natural history of Australia might be considered a blank. Therefore, they might well imagine with what interest he entered on this well-devised and well-considered plan of Dr. Neumayer, to obtain for us more

knowledge of the peculiar and wonderful works of Nature in her organic realm, which the continent of Australia may still have in store for us. He had said, we know less of the natural history of this part of the world than any other. But he would mention some points of interest in what we did know of Australian zoology, as justifying our hopes of what we might gain from this exploration. In organic nature there was scarcely any general proposition that could be made which was not affected more or less by exceptions. And the most remarkable exceptions to all the general propositions that had been founded upon observations of animal and vegetable life in the rest of the world had been results of discoveries made in Australia. When Cook, Banks, and Solander landed on its coast, almost the first creature they saw moving along the plain they knew not whether to call a bird or a beast, for it moved after the fashion of a bird on a pair of largely developed hinder extremities. It was that most singular form of animal life which we now know as the kangaroo. Observations since that time have multiplied our knowledge of the forms of this group of animals, and now there are some thirty or forty recorded species and genera from Australia. Besides the strange outward form of the kangaroo, we know from dissection that these animals present singular and curious modifications, especially of the internal structure of organs concerned in a recondite part of physiology. Without going into particulars, he might just mention one fact. Here was an animal that, full-grown, can reach nine feet high, whilst its young on coming into the world was not more than one inch in length. It was furnished, moreover, with that marsupial economy for the protection of the young which, in relation to transport to distant pools, seems connected closely with the climate in which the animal lived. Of the marsupial type of animal form there were numerous examples in Australia, differing in forms and habits, such as the wombat, the marsupial wolf, climbing phalanger, and so forth. The duck-mole and its monotrematous spiny ally were now the sole known exceptions to the teated character of their class. When, therefore, we had a knowledge, so singular and unlooked for, of types of two distinct and strange orders of the class of mammalia from one limited part of Australia, what might we not expect, if our observations were extended over the vast interior, as proposed by Dr. Neumayer? As to the birds, Australia was equally wonderful in its productions. Mr. Gould, who spent three years in collecting and observing, from a comparatively limited tract, brought home not a single species that was identical with what we had in our part of the world; even many of the genera were quite distinct. The results of his labours were to be found in the nine folio volumes which he had the good fortune to be spared to publish, on the 'Birds of Australia.' If he obtained such a collection from the south-eastern corner of Australia, what might we not expect from more extended explorations? It was not only the accession to our knowledge of new species and genera of birds and beasts, but, like the immortal discoveries of Robert Brown in botany, these acquisitions led to a re-casting of the science. The habits of some of the birds were most peculiar and instructive. We know that the magpie and the jackdaw are attracted by glittering substances; that if a lady in the country leaves her dressing-room window open, her best brooch may be taken and hidden. It seems a most idiotic procedure of such feathered pilferer. Yet the explanation of that curious habit is given by Gould, in connection with cognate birds in Australia, where they are not disturbed by man. The *chlamydera* is allied to our own magpies, and at the courting season the male bird builds a beautiful bower or avenue, overarched by long twigs or grass-stems, the entry and exit of which are adorned by various showy objects, as if to attract a mate by the show of a handsome establishment; which show the lover makes by picking up every pretty shell, every gay-coloured parrot's feather, every glittering mineral—even a gold nugget, if it came in his way, would be added to the heap. But this bower-building and adorning was not essential to the work

of continuing the species, for the female built her nest in the neighbouring tree. And to this indispensable construction our magpies and jackdaws were limited; they could not make their bower. There was not a wild or waste left in well-peopled Europe where they would not be scared from such work of supererogation—where some wanderer would not be attracted by their hoard. But now and then a little bit of the ancestral instinct would come out, which we should never have comprehended if it had not been for the observations of Gould. Again, Australia was the only country where birds put their eggs out to nurse. The mound-birds built up a heap of leaves twelve or fourteen feet high, and deposited their eggs in this mound, and left them to be hatched by the heat of the decaying vegetation; thereby showing a curious analogy to the snakes in our own country. Again, a word as to another class of animals,—the reptilia. The great Lace-lizard—largest of living Saurians (*Hydrosaurus giganteus*)—has its habitat in Australia; and, in the newer tertiaries of Queensland, vertebræ of a nearly allied Valanian lizard, almost rivalling in size those strange gigantic iguanodons and megalosauri of our older strata, had been found associated with remains of most strange, and, in some instances, gigantic forms of extinct marsupial quadrupeds. Some links between *Diprotodon* and *Macropus*, *Nototherium* and *Phascolarctos*, *Thylacoleo* and *Thylacinus*, *Megalanina*, and *Hydrosaurus* might be hoped for in the vast central tracts from east to west, now proposed to be explored by competent observers, with adequate means of collecting and preserving specimens. But then came the question, how were we to succeed in such expectations as these. He would appeal to gentlemen who had contributed to the prosperity of the British empire by their successful and sometimes daring speculations. For want of proper organisation, and for want of proper support, most explorations in Australia hitherto had been comparative failures. To this cause the results of Leichhardt's adventure had been lost; and, worse than that, we had lost Leichhardt himself. A man of business embarking in a commercial speculation with insufficient capital to command success, meets more blame than sympathy if he loses his venture: yet such unwisdom has characterised many of the exploratory surveys of the *terra incognita* of our great colony. Not only is the inadequate investment lost, but also the information gained by the explorers, by loss of the explorers themselves. In the present exploration he hoped for the sympathy of those who had gone out to Australia and had returned to this country with riches and honours. Dr. Neumayer was a scientific man, who held a position in Australia analogous to that of the Astronomer Royal in this country, and his well-considered project deserved our utmost attention. What he asked for was a sum of 7,000*l.* a-year for three years and a half; and he could not believe that either the Government or the Legislature would refuse that sum for an object so important; nor could he doubt that the Australian colonies themselves would supplement the grant by 5000*l.* or 6000*l.* more. A landed proprietor feels it not less his duty than his interest to have a due "survey" made of his property. The State seems to be in like relation to her colonies; to know their capabilities, their natural sources of wealth, is the essential preliminary to the derivation by the mother country of the full advantage of lands discovered and acquired for her by successful navigators.

Professor TYNDALL said the only point on which he felt himself competent to speak was quite an outlying subject, namely that of solar and terrestrial radiation, for observations on which Dr. Neumayer was eminently competent. He had had the opportunity of becoming acquainted with Dr. Neumayer, and the impression which he had derived was that Dr. Neumayer was a man of perfect straightforwardness and truth, and that he was entirely competent to undertake the work that he proposed to carry out.

Dr. NEUMAYER said he could only express his sincere thanks with reference to the words which had fallen from Professor Owen and Professor Tyndall.

Such words could only come from men who felt for science the same regard which he believed he had himself shown during his lifetime. It might, perhaps, appear strange that a foreigner should come forward to propose what he called a national British undertaking. But when they considered that he had been travelling along the coast of Australia at a time when the gold-fields had not been discovered, and when they further considered that he established on that continent the first observatory for physical observation, the results of which he had published in several volumes, he thought they would admit that he was entitled to consider himself an Australian colonist, and that he had not unsuccessfully aided, to the best of his ability, in the noble effort of British colonisation in Australia.

2. *Geographical Results of the Abyssinian Expedition, No. 4.* By C. R. MARKHAM, Esq., Secretary R.G.S., Geographer to the Abyssinian Expedition.

IN this Memoir, the fourth and concluding one of the series, Mr. Markham commenced by stating that the country between Antalo and Magdala is a mountainous region, entirely composed of volcanic rock, but divided into two very distinct parts by the river Taccaze. That to the north is an elevated ridge, crossed by several lofty ranges of mountains; whilst that to the south is a plateau of still greater height, cut by ravines of enormous depth. From Senafé to Antalo the rocks are almost all aqueous or metamorphic, with a few trachytic and basaltic boulders on the surface; but to the southward of Antalo there is a complete change, and this change is not confined to the geological features of the country. The scenery becomes grander, the vegetation more varied and more abundant, and the supply of water more plentiful. The peculiar feature of the country south of Antalo is that, while the backbone of the mountain-system runs north and south, with drainage to the east and west, it is crossed by ranges of great elevation, running across it in the direction of the drainage, and dividing it into sections. Of this nature are the Wodgerat and Ferrah ranges. From the Ferrah Amba there is a range of mountains running north and south, and forming a distinctly-marked watershed as far as Ashangi. The lower country to the eastward of this alpine region, from Antalo to the Taccaze, is occupied by lawless tribes of Mohammedan Gallas, who make incessant raids on the Christian inhabitants of the highlands, whose villages are seen usually perched on isolated hills surrounded by thick fences.

The mountainous country between Makhan and the basin of Lake Ashangi, about 14 miles across, is well wooded, the hill-sides being covered with junipers as tall as Scotch firs, flowering St. John's wort growing as trees, and a heath bearing white flowers, and